

The volume is, as usual with the Ray Society's publications, well printed, copiously illustrated, and, thanks to the labours of Mr. Hopkinson, provided with very complete lists of reference to literature, and an index.

TECHNICAL CHEMISTRY OF SUGAR AND STARCH.

Traité complet d'Analyse chimique, appliquée aux Essais industriels. By Prof. J. Post and Prof. B. Neumann. Deuxième Édition Française entièrement refondue. Tome seconde, deuxième fascicule. (Paris: A Hermann et Fils, 1910.) Price 8 francs.

THIS edition of Post and Neumann's work is translated by MM. Pellet and Chenu from the third German edition. The particular fascicule now under notice deals with the chemical control of the manufacture of sugars and starches.

Beetroot sugar naturally claims the lion's share of attention in a Continental book dealing with sugar, and, by following the text in the case of this product, a good idea of the work as a whole will be obtained.

An outline of the process by which the sugar is extracted gives the reader in a page or two a general introduction to his subject. This leads to an exhaustive account of the various methods which are available for determining the quantity of sugar present in any solution of saccharine substances. Naturally, they are well-known processes—areometric, gravimetric, polarimetric, and volumetric; but they are well explained, both as regards theory and practice, and illustrated with figures of the requisite apparatus.

Coming next to the more specialised part of the work, we find, to begin with, detailed instructions for the testing of beetroot seed, and also specifications (German, Austrian, and French) of the conditions which the seeds are required to fulfil. Next follows a scheme for the analysis of the roots themselves, including full directions for those most important preliminary operations the sampling and pulping of the materials.

Having the pulp, what, precisely, is the best method of extracting the sugar from it? Much depends on this, and a full discussion of the pros and cons. of the various processes is entered into; namely, as to whether water or alcohol is the best solvent, whether it should be used hot or cold, and whether this or that *modus operandi* is to be given the palm for merit. Eventually the conclusion is arrived at, and supported by Dr. Herzfeld "après de longues études," that extraction with cold water is in every way preferable to the use of alcohol for the purpose. It is simpler, easier, quicker, more economical, and more exact.

The samples of roots being analysed *secundum artem*, and the proportion of sugar duly determined, we pass to the *jus de diffusion* obtained in the actual manufacture. This is a weak aqueous solution of sugar and other soluble matter extracted from the roots by diffusion in water, and full directions are given for its examination. Next the syrups and massecuites are dealt with, modified processes of analysis being used, to suit their more highly saccharine nature; and eventually the finished products—

the dry sugars and molasses—come under review. This, however, is not all; there is the question of by-products to be considered, including the best methods of utilising the residues from the pulp and molasses; and also there is the examination of the various materials, namely, water, chalk, carbonic acid, sulphuric acid, strontianite, and so on, that are used in the various stages of the manufacture.

These matters are all dealt with at length. Many figures of the necessary apparatus are given, and also several tables of numerical values which will much facilitate the analyst's work.

The remaining sections of the book, treating of cane-sugar, starch, dextrine, and glucose, are written in a similar practically useful manner. If in these industries, or in the future British beet-sugar production to which some hopeful eyes are turning, any chemist requires a laboratory handbook, he might do worse than study the one under notice. C. S.

PETROLEUM MINING AND OIL-FIELDS.

Petroleum Mining and Oil-field Development. A Guide to the Exploration of Petroleum Lands, and a Study of the Engineering Problems connected with the winning of Petroleum. By A. Beeby Thompson. Pp. xx+362. (London: Crosby Lockwood and Son, 1910.) Price 15s. net.

THE engineering part of the book contains a large amount of instructive information, especially in regard to customary procedure in Russian oil-fields, but the author betrays a lack of knowledge of recent practice in some of the American oil-fields. Thus, his remarks on steel wire cable drilling on p. 193 are misleading, for it is common knowledge that at the present time this system is certainly in favour in the United States, and may, in fact, be said to be generally used for deep wells in that country, often after a depth of 600 to 800 feet has been reached. Similarly, the statement made on p. 218, as to the method adopted when a dropped tool cannot be recovered by "fishing," ignores the usual practice of "side-tracking" by raising the casing and drilling off with a wedge. Again, on p. 238, the diameter of the last string of casing is understated, for American wells, started with a diameter of 12 inches or 14 inches, are frequently completed at a depth of 3000 feet, or even 4000 feet, with a diameter of 6 inches, and it is incorrect to state that in the United States the casing is always manufactured from mild steel, for wrought-iron casing is manufactured in that country and is readily obtainable. In the description of the process of cementing wells, on pp. 266-8, there is no mention of the latest and most effective system, which consists in pumping the fluid cement, without any admixture of sand, through tubing packed inside the casing, so that it circulates below the shoe and passes up on the outside of the casing, which is afterwards lowered and the packer withdrawn.

The description of fishing tools is a good and comprehensive account of these appliances, but generally the treatment of the engineering branch of the subject is unequal, and there is a predominance of the Russian practice, to which the author unconsciously

supplies the key-note by comparing some oil-sands with "fresh caviare" (p. 286).

In the chapter devoted to the geology, chemical composition and treatment of petroleum, the author is evidently less at home, and there are many statements to which exception might be taken. Thus the description of the structure of the Peruvian oil-fields (p. 53) is inaccurate, a series of anticlinals with intervening synclines being represented as a persistent monoclinal. The expression "concentration" (p. 59) for the flowing of oil to replace that which has been ejected with much solid matter in suspension is a novel one in this connection, and the same may be said of the terms "low density," "low resistance," and "high absorption," applied to the spaces vacated.

As the author fails to distinguish between benzene and benzine (pp. 132, 138), it is not surprising that he should assert that the frequency of association of petroleum with coal and lignite is "a source of speculation." Taking the Stock Exchange meaning of speculation this may be true, but the frequency, even of adventitious proximity, still less of any causal relationship, is an obsolescent fallacy which it is not worth while to controvert afresh.

As this purports to be a practical work on petroleum mining and oil-field development, it is regrettable that greater judgment has not been displayed in the selection of the illustrations. Many of the plates add, no doubt, to the attractiveness of the volume, but convey no instruction. Amongst these are the photographic illustrations of groups of specimens of oil-rocks, bitumens, &c., a "mud-volcano" showing a level surface on which walking is being cautiously attempted, and a cart laden with Trinidad pitch.

More care should have been exercised in proof-reading. Thus in the last line but one of p. 223 the word "for" should be "by," and, judging by the context, the word "not" has been omitted in the first line of the following page, the author being thus made to state the reverse of what he intended.

ESSAYS ON ANGLING.

Minor Tactics of the Chalk Stream, and Kindred Studies. By G. E. M. Skues. Pp. xii+133. (London: Adam and Charles Black, 1910.) Price 3s. 6d. net.

IT is long since we have read any book, written by an angler for anglers, with so much pleasure as Mr. Skues's "Minor Tactics of the Chalk Stream." The polemics of ardent advocates of the dry fly or the wet fly may instruct, and possibly convert, but they weary the reader; the object of the present book is to advance no theory, but to make the angler approach his subject (and his trout) with an open mind, and think out for himself the problems with which he is confronted. Herein, we conceive, lies the true value of the book. The scene is laid upon the banks of a chalk stream, or of some carrier in the water-meadows that holds dark, hog-backed trout; for setting we have the willows and lush herbage of a southern valley, while the reed warbler, the dabchick, and the corn-crake, are cast for minor parts; yet there is

counsel which we would commend to those whose waters run through heather and bog-myrtle, where the trout are small, with fair golden bellies and ring-spotted sides, and the angler's music is the sweet spring cry of the curlew or the drumming of the snipe.

It is of the essence of Mr. Skues's teaching that the angler should cast aside the dogmas of his predecessors, and should study nature for himself; nature as seen in the trout, and on the banks of the stream, and, above all, in the life-histories of the insects eaten by the trout. There is no dogmatism here, but a pleasant didactic manner, instructing while it amuses, and amusing when it does not instruct; the moral is pointed by tales of full baskets or of bad days (our author's methods seem to have eliminated blanks), and there are constant reminders that bring the reader from his theories straight back to the river's bank. We may learn how to tie flies in imitation of the nymphs of Ephemerids, and how to fish with them, of an effort to reproduce the alder-fly lava and its results, and of the sad fate of the artificial freshwater shrimp; we may further read of the undoing of trout that bulge or tail, of trout that live in strange and unapproachable holes, and of those gourmet trout whose tastes need humouring.

The temptation to quote from Mr. Skues is irresistible, the difficulty is to select; whether to reproduce his tale of the day on which there was no rise of fly but a strong rise of water-rats, or his comments on flies, or on human nature and its reluctance to jeopardise a shilling cast and twopenny fly for the sake of getting a fish out of some weedy or bushy hole. Here, for instance, is one comment with which we cordially agree:—"Indeed, why a trout should take any artificial fly is a puzzle to me. The very best are not really very like the real things. One thing is clear: It is not form which appeals to the trout, but colour and size." In the light of this passage, the flies shown on the frontispiece should be studied and compared with the actual flies and nymphs.

Throughout the book the same ruling idea is found; the preaching of no system, the upholding of no tradition, but a plea for "unfettered judgment, independence of tradition, and, above all, the inquiring mind." We wish Mr. Skues success in his campaign; incidentally we wish him many readers, and we wish his readers many more such books as this. But when these books come let them be indexed; good advice is elusive, and captions alone are not always sufficient guides.

L. W. B.

ZOOLOGICAL STUDIES.

Studies from the Zoological Department, University of Birmingham. Vol. ii. Edited by Prof. F. W. Gamble, F.R.S. (1910.)

THIS volume consists of reprints of sixteen papers from various journals, the outcome of work done in the years 1905-9 by the staff and students of the zoological department of the University of Birmingham. It is appropriate that the first paper in the volume should be one by the late head of the depart-